

REMARKS/ ARGUMENTS

The Office Action of July 13, 2005 has been carefully reviewed and this response addresses the Examiner's concerns.

I. Status of the Claims

Claims 1 and 3-21 are pending in the application.

Claims 1 and 3-21 are rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the invention.

Claims 1, 3-13, 18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bouevitch (U.S. 2003/0021526) ("Bouevitch").

Claims 14-17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bouevitch in view of Shirasaki (U.S. 2002/0114090) ("Shirasaki").

Claims 1, 8 and 14 are amended in order to more render the meaning of the previous amendment unequivocal. Since the amendments are provided only render the meaning of the claim clearer, adding only terms previously discussed and which one of ordinary skill in the art would have understood as being in the claims before amendment, no new search is required and the amendments should be entered to place this Application in condition for allowance or, in the alternative, in better condition for appeal.

Support in the specification for the amendments

Amended claims 1, 8 and 14 include the phrase, "an angle of incidence does not equal an angle between a direction of propagation of said reflected distinct chromatic components and a normal to a surface of said holographic mirror at substantially a location of incidence." As stated in the response to the previous office action, the angle between a direction of propagation of said reflected distinct chromatic components and a normal to a surface of said holographic mirror is usually referred to as the angle of reflection. The phrase "at substantially a location of incidence" is part of the customary definition of the angle of incidence and the angle of reflection (see, for example, any textbook in optics such as E. Hetch, *Optics*, ISBN 0-201-11609-X, pp. 83 and 154, a copy of which was

provided in the response to the previous Final Office Action; see also Feynman Lectures on Physics, Vol. 1, p. 26-2, ISBN 0-201-02116-1-P), and describes the physical relationship between incoming and outgoing radiation at the holographic mirror that is shown in Figs. 2, 3 and 4.

II. The 35 U.S.C. §103(a) rejections

Claims 1, 3-13, 18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bouevitch (U.S. 2003/0021526) ("Bouevitch").

The Examiner states that Bouevitch teaches "modifying means 150 including at least one optical element capable of modifying a property of at least a portion of a beam of light and reflecting the modified beam of light back in substantially the same direction from which it originated." Bouevitch describes the modifying means 150 in Figures 3a-3d and in Figures 4b-4c. One salient characteristic of the modifying means 150 of Bouevitch is that, although the outgoing beam, 102b, (which the Examiner considers equivalent to the reflected beam) propagates in a direction anti-parallel to the direction of propagation of the incident beam, 102a, the outgoing beam is separated by a distance from the incoming beam. In the Applicant's invention, when a holographic mirror is used, the incident (incoming) beam and the reflected (outgoing) beam are substantially coincident. (see Figs. 2, 3 and 4 in the above Applicant's patent application). Assuming that, for arguments sake, the modifying means 150 or 650 of Bouevitch are replaced, as suggested by the Examiner, by modifying means in which the outgoing beam propagates in substantially the same path as the incoming beam, the resulting modified Figures 1a and 6a and 7 of Bouevitch are shown below.

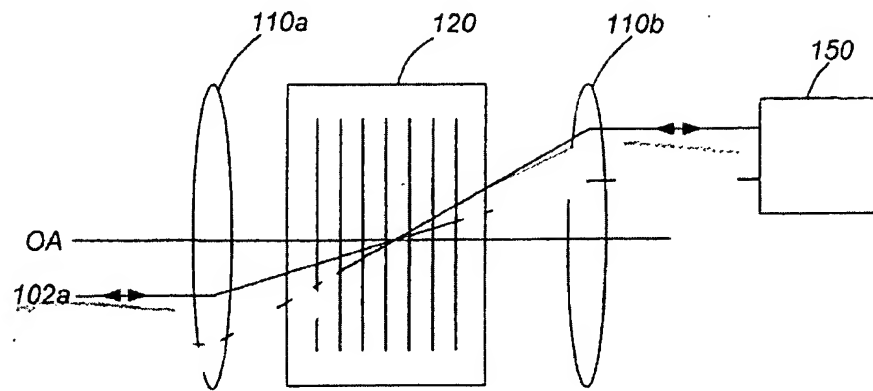


FIG. 1a
MODIFIED

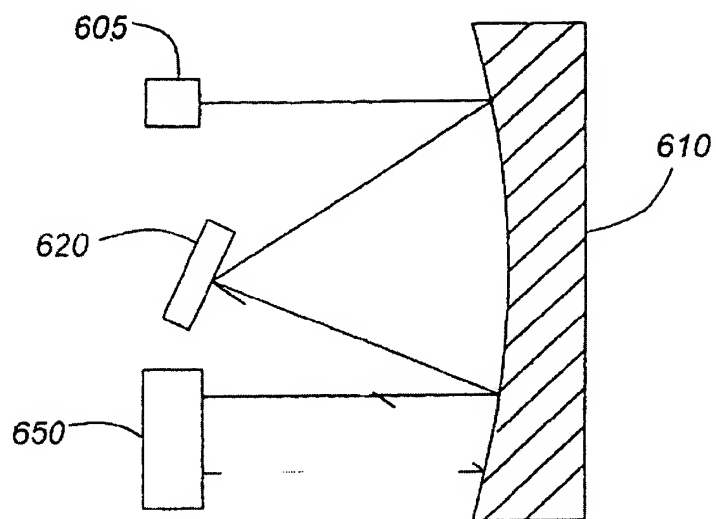


FIG. 6a

(MODIFIED)

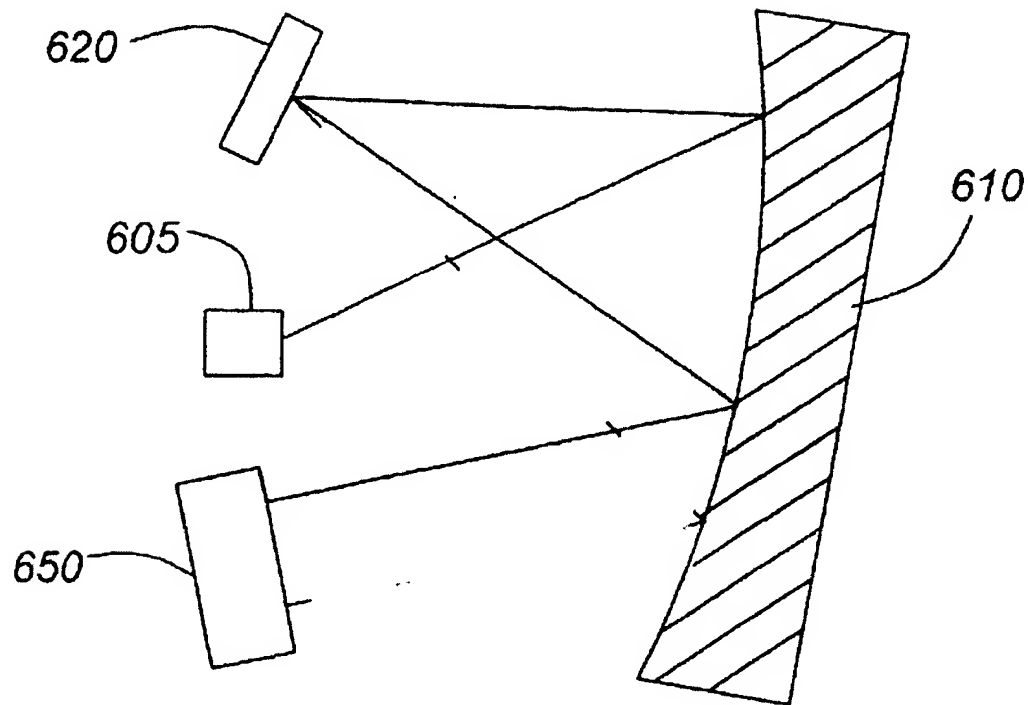


FIG. 7

(MODIFIED)

The modified version of Figures 1a, 6a and 7 of Bouevitch do not provide the chromatic dispersion compensation that the original systems shown in the original figures were designed to provide. Applicant respectfully asserts that the combination proposed by the Examiner would render the invention of Bouevitch unsuitable for the purpose it was intended for.

Applicant respectfully asserts that there is no motivation to modify Bouevitch by replacing the modifying means 150 or 650 with holographic mirrors as set forth in the

Applicant's claimed invention, holographic mirrors having "reflection properties different from a conventional mirror, [such that,] in reflecting said distinct chromatic components, a direction of propagation of the distinct chromatic components [is] altered by means of diffraction by the holographic mirror; and whereby, in reflecting said distinct chromatic components by means of diffraction, an angle of incidence does not equal an angle between a direction of propagation of the reflected distinct chromatic components and a normal to a surface of the holographic mirror, said reflected distinct chromatic components emanating from the surface," since that replacement would render the Bouevitch invention inoperable as shown above. If the references when combined would render the prior art invention being modified unsatisfactory for its intended purpose, there is no motivation to combine the references. *McGinley v. Franklin Sports, Inc.*, 262 F.3d at 1354; *In re Gordon*, 733 F.2d at 902. Therefore, there is no motivation to modify Bouevitch by replacing modifying means with holographic mirrors such as those in the Applicant's claimed invention.

The Examiner states that holographic mirrors are known in the art. Applicant states that most optical elements are known and inventions in the optical field, as in most other art areas, arise from a combination of old elements and each element may often be found in the prior art. However, mere identification in the prior art of each element is insufficient to defeat the patentability of the combined subject matter as a whole. *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998); *In re Kahn*, opinion 04-1616, decided March 22, 2006 (Fed. Cir. 2006).

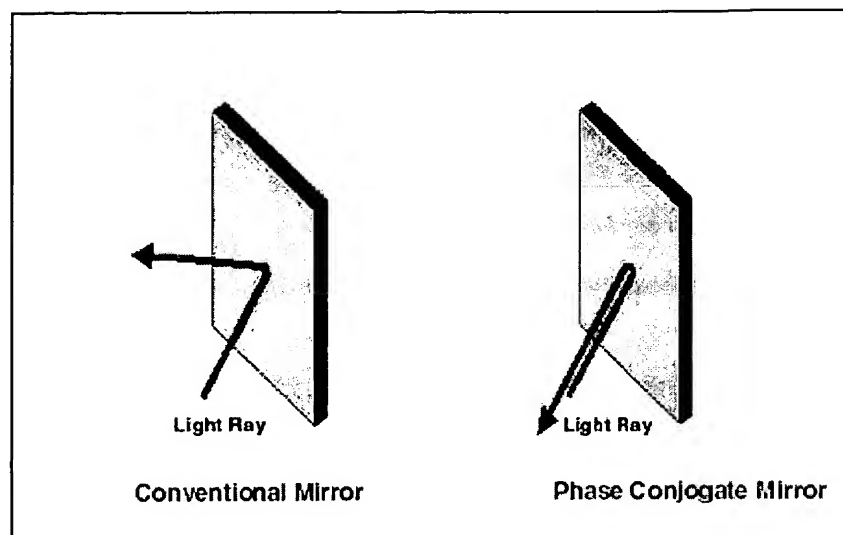
“To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.” (MPEP 2143)

Since Bouevitch does not teach or suggest at least one distinct limitation of independent claims 1, 8 and 14 and since there is no motivation to replace the modifying means 150 or 650 in Bouevitch with the holographic mirror used in the applicants claimed invention, Applicant respectfully asserts that a *prima facie* case of obviousness has not been established.

Since claims 3-7 are dependent in claim 1, claims 9-13 are dependent on claim 8, and claims 18 and 21 are dependent on claim 14, Applicant respectfully states that a *prima facie* case of obviousness has not been established for claims 3-7, 9-13, and 18 and 21.

Furthermore, regarding claim 21, Applicant respectfully state that a phase conjugate mirror, as understood by one of ordinary skill in the art, retroreflects all incoming rays back to their origin (see, for example,

http://www.photonics.cusat.edu/Research_Nonlinear%20Optics_OPC.html). The figure below, illustrates the differences between conventional mirrors, such as those used in *Bouevitch* and phase conjugate mirrors.



If the modifying means 650 in Figure 6a of *Bouevitch* were a phase conjugate mirror, the resulting system would be as in the modified Figure 7 or modified Figure 6a previously discussed above. Therefore, there would be no motivation to modify *Bouevitch* by replacing the modifying means 650 with a phase conjugate mirror since it would render the resulting system inoperable.

Applicant respectfully asserts that a prima facie case of obviousness has not been established for claim 21.

Therefore, Applicant asserts that claims 1, 3-13, 18 and 21 are patentable over *Bouevitch*.

Claims 14-17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bouevitch in view of Shirasaki (U.S. 2002/0114090) ("Shirasaki").

As stated above, *Bouevitch* does not disclose a holographic mirror having "reflection properties different from a conventional mirror, [such that,] in reflecting the distinct chromatic components, a direction of propagation of the distinct chromatic components is altered by means of diffraction by the holographic mirror; and whereby, in reflecting the distinct chromatic components by means of diffraction, an angle of incidence does not equal an angle between a direction of propagation of the reflected distinct chromatic components and a normal to a surface of the holographic mirror, the reflected distinct chromatic

components emanating from the surface.” Shirasaki et al. do not disclose a holographic having “reflection properties different from a conventional mirror[, wherein,] in reflecting the distinct chromatic components, a direction of propagation of the distinct chromatic components is altered by means of diffraction by the holographic mirror; and whereby, in reflecting the distinct chromatic components by means of diffraction, an angle of incidence does not equal an angle between a direction of propagation of the reflected distinct chromatic components and a normal to a surface of the holographic mirror, the reflected distinct chromatic components emanating from the surface.” Therefore, combining Bouevitch. with Shirasaki et al. cannot be used to establish nor disclose a holographic mirror having “reflection properties different from a conventional mirror [, wherein,] in reflecting the distinct chromatic components, a direction of propagation of the distinct chromatic components is altered by means of diffraction by the holographic mirror; and whereby, in reflecting the distinct chromatic components by means of diffraction, an angle of incidence does not equal an angle between a direction of propagation of the reflected distinct chromatic components and a normal to a surface of the holographic mirror, the reflected distinct chromatic components emanating from the surface.”

As stated above, replacing the modifying means 150 or 650 in Bouevitch. with holographic mirrors having “reflection properties different from a conventional mirror [, wherein,] in reflecting the distinct chromatic components, a direction of propagation of the distinct chromatic components is altered by means of diffraction by the holographic mirror; and whereby, in reflecting the distinct chromatic components by means of diffraction, an angle of incidence does not equal an angle between a direction of propagation of the reflected distinct chromatic components and a normal to a surface of the holographic mirror, the reflected distinct chromatic components emanating from the surface,” since that replacement would render the Bouevitch invention inoperable. Combining Bouevitch with Shirasaki et al. introduces diffraction gratings but does not render the resulting system operable if the modifying means in Bouevitch are replaced with holographic mirrors having reflection properties different from a conventional mirror.

There is no motivation to replace the modifying means in Bouevitch with holographic mirrors having “reflection properties different from a conventional mirror [, wherein,] in

reflecting the distinct chromatic components, a direction of propagation of the distinct chromatic components is altered by means of diffraction by the holographic mirror; and whereby, in reflecting the distinct chromatic components by means of diffraction, an angle of incidence does not equal an angle between a direction of propagation of the reflected distinct chromatic components and a normal to a surface of the holographic mirror, the reflected distinct chromatic components emanating from the surface” and combining Bouevitch with Shirasaki et al. does not alter that lack of motivation.

Applicant also respectfully states that there is no motivation to combine Shirazaki with Bouevitch since the pair of separating diffraction gratings does not provide any additional compensation for chromatic dispersion.(See, for example, paragraph 8 in the Applicant’s specification.)

Therefore, Applicant asserts that claims 14-17, and 19- 20 are patentable over Bouevitch in view of Shirasaki et al.

IV. Conclusion

In conclusion, in view of the above remarks, Applicant respectfully requests the Examiner find claims, 1 and 3- 21 as amended, allowable over the prior art and pass this case to issue.

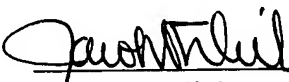
No additional fees are required. However, if fees are required, they should be charged to Deposit Account No. 50-1078.

In accordance with Section 714.01 of the MPEP, the following information is presented in the event that a call may be deemed desirable by the Examiner:

JACOB N. ERLICH (617) 854-4000.

Respectfully submitted,
Thomas W. Stone, Applicant

Dated: April 10, 2005

By: 
Jacob N. Erlich
Reg. No. 24,338
Attorney for Applicant